

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY

P.O. BOX 25201, RALEIGH, N.C. 27611-5201 LYNDO TIPPETT

GOVERNOR

SECRETARY

June 16, 2004

STATE PROJECT: 34517.1.1 (R-2911D)

COUNTY:

Rowan

DESCRIPTION:

Bridge on US 70 over Norfolk Southern Railroad Between

SR 1739 and SR 1953

SUBJECT:

Geotechnical Report – Bridge Foundation Investigation

This report encompasses the proposed dual structures on the US 70 widening job over Norfolk Southern Railroad. The existing bridge will be replaced on location with the proposed left lane structure while the proposed right lane structure will be located south of existing US 70. Bridge design specifications are for 80" to 82" steel girder and composite deck structures with 3 spans on a 32° 49' 25.4" skew. Individual structure width is 39'3" and end bent slopes are proposed at 2:1 with class II Rip Rap slope protection.

Foundation test borings were performed with a CME-550 drill machine utilizing NW Casing, Tri-Cone roller bit and automatic drop hammer. The field investigation for this project was conducted in April of 2004.

Physiography/Geology

The project corridor is located in the piedmont region of North Carolina in Rowan County west of the city of Salisbury. Geologically this site is part of the Charlotte Belt and is underlain by metamorphosed mafic rock types. Topography in the vicinity of the bridge site ranges from flat to moderately sloping with mature trees, and shrubs present along the slopes of Norfolk Southern Railroad.

Soil horizons encountered at the site are limited to roadway fill, and residual soils. Roadway fill was encountered along existing US 70 at each end bent of the proposed left lane structure. Roadway fill consists of medium stiff to stiff silty sandy clay (A-6) and loose to medium dense clayey silty sand (A-2-4). Residual soils are composed of medium

Sheet 3

2

stiff to hard silty sandy clay (A-7-5, A-7-6, A-6), medium stiff to hard clayey sandy silt (A-4), and loose to very dense silty sand (A-2-4). Weathered rock was encountered at all boring locations.

Foundation Materials

End Bent 1Left and Right Lane:

This bent is located south of NSRR with borings for the left lane structure taken atop of the existing US 70 roadway fill and right lane borings performed on natural ground. A total of four borings were performed for this bent location. Roadway fill was encountered for the first 14 to 20 feet of the left lane structure and consists primarily of loose to medium dense gray-white-tan clayey silty sand (A-2-4) with quartz rocks. The roadway fill encountered in boring EB1-B LT LN between elevation 750.5' and 745.5' is an extremely high PI clay (PI=80). Further description of this soil is a medium stiff gray silty clay (A-7-5). Residual soils were encountered next and traverse from beneath the left lane fill to natural ground along the right lane structure. Residual soil is 20.8 to 26.8 feet in thickness and consists of a variety of soil types and consistencies. The various residual soil types comprising this end bent section are very stiff to stiff tan-brown silty sandy clay (A-7-5), medium dense to very dense tan-gray-white silty sand (A-2-4), and stiff to hard gray-tan-brown micaceous clayey sandy silt (A-4). It should be further noted that boring EB1-B RT LN encountered a thin weathered rock seam approximately 10 feet below natural ground. The natural weathered rock horizon was encountered by all borings between elevation 732.1 and 720.4 feet

Bent 1:

Four borings drilled along this bent are located approximately 50 feet south of NSRR and were performed over natural ground. Residual soil is encountered at the ground surface and extends 25.6 to 35.6 feet in depth. Residual soil types consist of medium stiff to stiff tan-brown-gray-white micaceous silty sandy clay (A-7-6), medium stiff to stiff tanbrown-black micaceous clayey sandy silt (A-4), and medium dense to very dense tangray-brown-white silty sand (A-2-4). Weathered rock was encountered below residual soil at each boring location and varies in elevation between 727.5 and 718.0 feet.

Bent 2:

Three borings completed along this bent are located approximately 50 feet north of NSRR and were all on top of natural ground. Residual soil is encountered at the ground surface and extends 28.8 to 41.0 feet in depth. Residual soil consists of medium stiff to stiff redtan-brown sandy silty clay (A-7-6), and loose to very dense tan-gray-white silty sand (A-2-4). Weathered rock lies below residual soil between elevation 721.0 and 711.7 feet.

End Bent 2:

This bent is located well north of NSRR with borings for the left lane structure taken atop of the existing US 70 roadway fill and right lane borings performed over natural ground. A total of four borings were performed for this bent location. Roadway fill was encountered for the first 10.0 to 18.2 feet of the left lane structure and consists primarily of medium stiff to stiff tan-gray silty sandy clay (A-7-6). The roadway fill from elevation